

PATENT COOPERATION TREATY

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From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

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PCT

NOTIFICATION OF TRANSMITTAL OF INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Rule 71.1)

Date of Mailing
(day/month/year)

02 JUL 2004

Applicant's or agent's file reference

FLARION-1PCT

IMPORTANT NOTIFICATION

International application No.

International filing date (day/month/year)

Priority date (day/month/year)

PCT/US01/28313

11 September 2001 (11.09.2001)

15 September 2000 (15.09.2000)

Applicant

FLARION TECHNOLOGIES, INC.

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.
4. **REMINDER**

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices)(Article 39(1))(see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

Name and mailing address of the IPEA/US

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Commissioner for Patents
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Form PCT/IPEA/416 (July 1992)

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference FLARION-1PCT	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/US01/28313	International filing date (day/month/year) 11 September 2001 (11.09.2001)	Priority date (day/month/year) 15 September 2000 (15.09.2000)
International Patent Classification (IPC) or national classification and IPC IPC(7): H04J 11/00 and US Cl.: 370/208		
Applicant FLARION TECHNOLOGIES, INC.		
<p>1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of <u>7</u> sheets, including this cover sheet.</p> <p><input type="checkbox"/> This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).</p> <p>These annexes consist of a total of <u>0</u> sheets.</p> <p>3. This report contains indications relating to the following items:</p> <p>I <input checked="" type="checkbox"/> Basis of the report</p> <p>II <input type="checkbox"/> Priority</p> <p>III <input type="checkbox"/> Non-establishment of report with regard to novelty, inventive step and industrial applicability</p> <p>IV <input type="checkbox"/> Lack of unity of invention</p> <p>V <input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p>VI <input type="checkbox"/> Certain documents cited</p> <p>VII <input type="checkbox"/> Certain defects in the international application</p> <p>VIII <input type="checkbox"/> Certain observations on the international application</p>		
Date of submission of the demand 06 March 2002 (06.03.2002)	Date of completion of this report 02 June 2004 (02.06.2004)	
Name and mailing address of the IPEA/US Mail Stop PCT, Attn: IPEA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (703) 305-3230	Authorized officer Rhirin Sam <i>Karen L. Ward</i> Telephone No. (703) 308 - 9294	

I. Basis of the report

1. With regard to the elements of the international application:*

- ☒ the international application as originally filed.
- ☒ the description:
pages 1-17 as originally filed
pages NONE, filed with the demand
pages NONE, filed with the letter of _____.
- ☒ the claims:
pages 18-29, as originally filed
pages NONE, as amended (together with any statement) under Article 19
pages NONE, filed with the demand
pages NONE, filed with the letter of _____.
- ☒ the drawings:
pages 1-9, as originally filed
pages NONE, filed with the demand
pages NONE, filed with the letter of _____.
- ☐ the sequence listing part of the description:
pages NONE, as originally filed
pages NONE, filed with the demand
pages NONE, filed with the letter of _____.

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language _____ which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in printed form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☒ The amendments have resulted in the cancellation of:

- ☒ the description, pages NONE
- ☒ the claims, Nos. NONE
- ☒ the drawings, sheets/fig NONE

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

** Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.

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V. Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. STATEMENT

Novelty (N)	Claims <u>Please See Continuation Sheet</u>	YES
	Claims <u>Please See Continuation Sheet</u>	NO
Inventive Step (IS)	Claims <u>Please See Continuation Sheet</u>	YES
	Claims <u>Please See Continuation Sheet</u>	NO
Industrial Applicability (IA)	Claims <u>Please See Continuation Sheet</u>	YES
	Claims <u>Please See Continuation Sheet</u>	NO

2. CITATIONS AND EXPLANATIONS

Please See Continuation Sheet

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Supplemental Box

(To be used when the space in any of the preceding boxes is not sufficient)

V. 1. Reasoned Statements:

The opinion as to Novelty was positive (Yes) with respect to claims 4-8, 12, 14, 15, 19, 24-27, 30-37, 39, 40, 47, 52, and 55-62
The opinion as to Novelty was negative (No) with respect to claims 1-3, 9-11, 13, 16-18, 20-23, 28, 29, 38, 41-46, and 48-51, 53-54
The opinion as to Inventive Step was positive (Yes) with respect to claims 4, 5, 12, 14, 24-27, 30-37, 39, 40, 47, 52, and 55-62
The opinion as to Inventive Step was negative (NO) with respect to claims 1-3, 6-11, 13, 16-23, 28, 29, 38, 41-46, and 48-51, 53-54
The opinion as to Industrial Applicability was positive (YES) with respect to claims 1-62
The opinion as to Industrial Applicability was negative (NO) with respect to claims NONE

V. 2. Citations and Explanations:

Claims 1-3, 9-11, 13, 16-23, 28, 29, 38, 41-46, and 48-51, 53-54 lack novelty under PCT Article 33(2) as being anticipated by Wright et al. (U.S. Patent 6,054,896).

Wright et al. discloses the invention (claims 1 and 13) as claimed including a communication method, comprising:

- (a) performing an amplification operation on each of a first through Nth subcarrier signal to produce first through Nth amplified subcarrier signals, wherein N is a positive integer (see Fig. 2, elements 15, 16, 21 and 25, col. 7, lines 53-60).
- (b) operating a combining circuit to combine the first through Nth amplified subcarrier signals to generate a frequency division multiplexed transmission signal (see Fig. 2, elements 25 and ks(t), col. 7, lines 65-67, and col. 8, lines 1-4).

Regarding claims 2, 9, and 10, Wright et al discloses the first through Nth subcarrier signals are analog signals and wherein the step of performing an amplification operation on each of the first through Nth subcarrier signals includes:

- (a) performing an analog signal amplification operation (see Fig. 2, elements 15 and 16, col. 7, lines 45, 52-64).

Regarding claims 3 and 11, Wright et al discloses the first through Nth subcarrier signals are

Supplemental Box

(To be used when the space in any of the preceding boxes is not sufficient)

analog signals and wherein the step of performing an amplification operation on each of the first through Nth subcarrier signals includes:

- (a) performing, in parallel, analog power amplification operations on a plurality of the first through Nth subcarrier signals (see Fig. 2, elements 15, 16, and 25, col. 7, lines 45-47, 65-67).

Regarding claims 16, 49, and 51-54, Wright et al discloses a communication method, comprising:

- (a) operating each of a first through Nth signal generator to receive a digital symbol and generate an analog subcarrier signal there from, the first through Nth signal generators generating first through Nth analog subcarrier signals (see Fig. 2, elements 22 and 27, col. 7, lines 60-63).
- (b) operating each of a first through Nth amplification circuit to perform an amplification operation on a different one of the first through Nth analog subcarrier signals to generate first through Nth amplified signals (see Fig. 2, element 15 and 16, col. 7, lines 53-57).
- (c) operating a combiner circuit to combine the first through Nth amplified signals into a single transmission signal (see Fig. 2, element 25, col. 7, lines 65-66).

Regarding claims 17 and 18, Wright et al discloses further comprising:

- (a) performing a power amplification operation on the transmission signal (see Fig. 2, element 25, col. 7, lines 65-67).

Regarding claims 20-23 and 50, Wright et al. discloses the step of operating each of a first through Nth signal generator includes:

- (a) operating the first through Nth signal generators in parallel (see Fig. 2, elements 15 and 16, col. 7, lines 52-55).

Regarding claims 28, 38, and 41, Wright et al. discloses a communication apparatus, comprising:

- (a) a plurality of amplification circuits for performing amplification operations on analog subcarrier signals to produce a plurality of amplified analog subcarrier signals (see Fig. 2, elements 15 and 16, col. 7, lines 53-57).
- (b) a combining circuit coupled to the plurality of amplification circuits, the combining circuit combining the analog subcarrier signals into an analog transmission signal (see Fig. 2, element 25, col. 7, lines 65-67, and col. 8, lines 1-4).

Regarding claims 42 and 43, Wright et al. discloses a communications system, comprising:

- (a) first through Nth amplifiers for amplifying first through Nth analog subcarrier signals, respectively, to generate first through Nth amplified subcarrier signals, where N is a positive integer greater than 1 (see Fig. 2,

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elements 15 and 16, col. 7, lines 52-57).

(b) a combiner circuit coupled to the first through N amplifier for adding the analog subcarrier signals together to generate a frequency division multiplexed signal (see Fig. 2, element 25, col. 7, lines 65-67, col. 8, lines 1-4).

Regarding claims 44, 45, and 48, Wright et al. discloses the system further comprising, first through Nth analog signal generators for generating the analog subcarrier signals from first through Nth digital signals, each of the first through Nth analog signal generators being coupled to a corresponding one of the first through Nth amplifiers (see Fig. 2, element 22, col. 7, lines 43-44).

Regarding claim 46, Wright et al. discloses the system further comprising:

(a) first through Nth filters for coupling the first through Nth power amplification circuits to the combiner circuit (see Fig. 2, element 25, col. 7, lines 49-51).

2. Claims 6-8, 19, and 29 lack an inventive step under PCT Article 33(3) as being obvious over Wright et al (U.S. Patent 6,054,896) in view of Kumar (U.S. Patent 5,949,796).

Regarding claims 6 and 7, Wright et al does not disclose the generated transmission signal is an OFDM signal. However, Kumar discloses the generated transmission signal (see Fig. 8, col. 32, lines 58-63). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine OFDM signal teaching by Kumar with Wright et al. The motivation for doing so would have been to provide to eliminate the interference signal. Therefore, it would have been obvious to combine Kumar and Wright et al to obtain the invention as specified in the claims 6 and 7.

Regarding claims 8 and 19, Wright et al does not disclose operating a plurality of N sinusoidal signal generators to generate the first through Nth subcarrier signals from a plurality of digital input symbols. However, Kumar discloses operating a plurality of N sinusoidal signal generators to generate the first through Nth subcarrier signals from a plurality of digital input symbols (see Figs. 4, 6, and 8, col. 40, lines 30-44, col. 43, lines 66-67, and col. 44, line 1). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine a plurality of N sinusoidal signal generators to generate the first through Nth subcarrier signals from a plurality of digital input symbols teaching by Kumar with Wright et al. The motivation for doing so would have been to provide to generate an additional amount of time guard interval. Therefore, it would have been obvious to combine Kumar and Wright et al to obtain the invention as specified in the claims 8 and 19.

Regarding claim 29, Wright et al does not disclose each one of the plurality of sinusoidal signal generators being coupled to a corresponding one of the power amplification circuits. However, Kumar discloses each one of the

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plurality of sinusoidal signal generators being coupled to a corresponding one of the power amplification circuits (see Fig. 4, elements 71 and 67, col. 40, lines 38-44). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine one of the plurality of sinusoidal signal generators being coupled to a corresponding one of the power amplification circuits teaching by Kumar with Wright et al. The motivation for doing so would have been to provide to generate the FM band signals. Therefore, it would have been obvious to combine Kumar and Wright et al to obtain the invention as specified in the claim 29.

Claims 4, 5, 12, 14, 24-27, 30-37, 39, 40, 47, 52, and 55-62 meet the criteria set out in PCT Article 33(2)-(3), because:

Regarding claims 4 and 5, the prior art does not teach or fairly suggest at least some of the subcarrier signals have a nearly constant peak amplitude.

Regarding claims 12, 14, 39, 40, and 47, the prior art does not teach or fairly suggest filtering at least some of the subcarrier signals amplified by performing a non-linear power amplification operation to reduce signal distortions introduced by the non-linear amplification operation.

Regarding claims 24-27 and 30-37, the prior art does not teach or fairly suggest extracting from a received symbol a magnitude value and a phase value; and operating a sinusoidal signal generator to generate one of the analog subcarrier signals as a function of the extracted phase and magnitude value.

Regarding claims 52 and 55, the prior art does not teach or fairly suggest the at least one non-linear amplifier is a fixed gain amplifier.

Regarding claims 56-62, the prior art does not teach or fairly suggest generating, as a function of the calculated subcarrier signal path group signal delay, calculated common signal path group signal delay, and communications channel group signal delay.